



Sage Creek High School

## Course Syllabus

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Introduction to Computer Science

# 2024-25

# Course Outline: CS Python Fundamentals

This course is designed to offer an introduction to computer science. Students will learn the basics of computer programming along with the basics of computer science. The material emphasizes computational thinking and helps develop the ability to solve complex problems.

This course covers the basic building blocks of programming along with other central elements of computer science. It gives a foundation in the tools used in computer science and prepares students for further study in computer science, including AP Computer Science Principles and AP Computer Science A courses.

## Prerequisites

No prior computer science knowledge or experience is necessary for this course.

## Teaching Strategies

The course was designed to be used in a blended classroom. The primary language for the course is Python. The course will consist of video lectures, daily programming exercises, longer coding assignments, regular quizzes, projects, and exams. Students will also participate in online discussion forums.

One major element of the content is the Code-Along videos. In these videos, students are asked to follow along with the instructor as they code. By coding in small chunks and pausing and repeating segments as necessary students are able to work through new topics at their own pace and work towards mastery of the material.

As they master these techniques, students are asked to combine them in longer exercises that let them build a deeper understanding of computer science and programming. Regular quizzes and tests give them feedback on their progress.

## Unit Overview

- Unit 1: Beginning in Computer Science
- Unit 2: Number Calculations and Data
- Unit 3: Making Decisions
- Unit 4: Repetition and Loops
- Unit 5: Programming in EarSketch
- Unit 6: Graphics
- Unit 7: Functions
- Unit 8: Lists
- Unit 9: 2D Lists
- Unit 10: Robotics
- Unit 11: Internet
- Exploring Careers in Computer Science

# Units

## Unit 1: Beginning in Computer Science

Lesson 1: What is Computer Science?  
Lesson 2: Using Python  
Lesson 3: First Program  
Lesson 4: Hardware and Software  
Lesson 5: Output  
Lesson 6: Input  
Lesson 7: Data Types and Variables  
Lesson 8: Analog vs. Digital  
Lesson 9: Understanding Binary  
Assignment: Silly Sentences

## Unit 2: Number Calculations and Data

Lesson 1: Computer History  
Lesson 2: Basic Calculations  
Lesson 3: Modular Division  
Lesson 4: Built-in Functions  
Lesson 5: Random Numbers  
Lesson 6: Big Data  
Lesson 7: Working with a Real Data Set  
Assignment: Room Area

## Unit 3: Making Decisions

Lesson 1: Functions  
Lesson 2: Simple Ifs  
Lesson 3: Logical Operators  
Lesson 4: If – Else  
Lesson 5: Else – If  
Lesson 6: Defining Algorithms  
Lesson 7: Algorithm Challenge  
Assignment: Chatbot



## **Unit 4: Repetition and Loops**

Lesson 1: Loops  
Lesson 2: Count Variables  
Lesson 3: Two Ways to End a Loop  
Lesson 4: Data Revisited  
Lesson 5: Review - Looping  
Lesson 6: Range Function  
Lesson 7: For Loops  
Lesson 8: Counting by Other Than 1  
Lesson 9: Summing  
Lesson 10: Review of Algorithms and Tracing  
Lesson 11: Modeling and Simulation  
Assignment: Divisible by Three

## **Unit 5: Programming in EarSketch**

Lesson 1: Getting Started with EarSketch  
Lesson 2: The Building Blocks of a Program  
Lesson 3: Debugging and Documenting  
Lesson 4: Effects in EarSketch  
Lesson 5: Effects and Envelopes  
Lesson 6: Tempo and Pitch  
Lesson 7: Copyright  
Lesson 8: Evaluating Correctness  
Lesson 9: Musical Form and Custom Functions  
Lesson 10: Recording and Uploading Sounds  
Lesson 11: Making Custom Beats  
Lesson 12: Looping  
Lesson 13: String Operations  
Lesson 14: Musical Repetition  
Assignment: Design a Ringtone in EarSketch

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## Unit6:Graphics

Lesson1: ColorCode

Lesson2: ColorsandLoops

Lesson3: X&YCoordinates

Lesson4: Lines

Lesson5: DrawaHouse

Lesson6: Circles

Lesson7: Emoticons

Lesson8: Animation

Assignment: Animation

## Unit7:Functions

Lesson1: WhatareFunctions?

Lesson2: CreatingFunctions

Lesson3: Parameters

Lesson4: ReturningValues

Lesson5: UsingSeveral Functions

Lesson6: TracingCode

Assignment: Calendar

## Unit8:Lists

Lesson1: WhatareLists?

Lesson2: DeclaringLists

Lesson3: Elements Index

Lesson4: ForLoopsandLists

Lesson5: ListMethods

Lesson6: ListsasParameters  
Lesson7: ListsandStrings  
Lesson8: SortingandSearching  
Lesson9: WritingaSimpleSearch  
Lesson10: WritingaSimpleSort  
Assignment: BirthdayOrganizer

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## Unit 9: 2D Lists

Lesson 1: What is a 2D List?  
Lesson 2: Declaring 2D Lists  
Lesson 3: Loops with 2D Lists  
Lesson 4: Algorithms with 2D Lists  
Lesson 5: Graphics and 2D Lists  
Lesson 6: Animating with 2D Lists  
Assignment: Matrices

## Unit 10: Robotics

## Unit 11: Internet

Lesson 1: What is the Internet?  
Lesson 2: IP Addressing and DNS  
Lesson 3: Packets and Routers  
Lesson 4: Making Web Pages – HTML Part 1  
Lesson 5: Making Web Pages – HTML Part 2  
Lesson 6: Making Web Pages – HTML Part 3  
Lesson 7: Cybersecurity  
Lesson 8: Net Neutrality  
Assignment: Build Your Own Webpage

## Exploring Careers in Computer Science

Lesson 1: Who Uses Computer Science?

Lesson 2: Data Scientists  
Lesson 3: Computer Science in Medicine  
Lesson 4: Game Developers  
Lesson 5: Computer Science in Entertainment  
Lesson 6: Dance and Music  
Lesson 7: Cybersecurity  
Lesson 8: Social Justice  
Lesson 9: Sports  
Lesson 10: Starting Your Own Business  
Lesson 11: Web Design

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## Schedule

### Week 01

- Welcome to the Course
- Introduction to EarSketch
- 1.1 What is Computer Science?
- 1.2 Using Python
- 1.3 First Program

### Week 02

- 1.4 Hardware and Software
- 1.5 Output
- 1.6 Input
- Unit 1 Quiz

### Week 03

- 1.7 Data Types and Variables
- 1.8 Analog vs. Digital
- 1.9 Understanding Binary

### Week 04

- Unit 1 Vocabulary & Test Review
- Unit 1 Assignment: Silly Sentences
- Unit 1 Test

### Week 05

- 2.1 Computer History
- 2.2 Basic Calculations

- 2.3ModularDivision
- 2.4Built-inFunctions

## Week06

- 2.5RandomNumbers
- Unit2Quiz
- 2.6BigData
- 2.7WorkingwithaReal DataSet

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## Week07

- Unit2Vocabulary&TestReview
- Unit2Assignment: RoomArea
- Unit2Test

## Week08

- 3.1Functions
- 3.2Simple Ifs
- 3.3Logical Operators
- 3.4 If-Else

## Week09

- 3.5Else- If
- Unit3Quiz
- 3.6DefiningAlgorithms
- 3.7AlgorithmChallenge

## Week10

- Unit3Vocabulary&TestReview
- Unit3Assignment: Chatbot
- Unit3Test

## Week11

- 4.1Loops
- 4.2CountVariables

- 4.3TwoWaystoEndaLoop

## Week12

- 4.4DataRevisited
- 4.5Review-Looping
- 4.6RangeFunctions

## Week13

- 4.7ForLoops
- 4.8CountingbyOtherThan1
- Unit4Quiz

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## Week 14

- 4.9 Summing
- 4.10 Review of Algorithms and Tracing
- 4.11 Modeling and Simulation

## Week 15

- Unit 4 Vocabulary & Test Review
- Unit 4 Assignment: Divisible by Three
- Unit 4 Test

## Week 16

- 5.1 Getting Started with EarSketch
- 5.2 The Building Blocks of a Program
- 5.3 Debugging and Documenting
- 5.4 Effects in EarSketch
- 5.5 Effects and Envelopes

## Week 17

- 5.6 Tempo and Pitch
- 5.7 Copyright
- 5.8 Evaluating Correctness
- 5.9 Musical Form and Custom Functions
- 5.10 Recording and Uploading Sounds
- 5.11 Making Custom Beats

- 5.12 Looping

## Week 18

- 5.13 String Operations
- 5.14 Musical Repetition
- Unit 5 Assignment: Design a Ringtone in EarSketch

## Week 19

- 6.1 Color Code
- 6.2 Color Revisited
- 6.3 X & Y Coordinates
- 6.4 Lines
- 6.5 Draw a House
- 6.6 Circle
- Unit 6 Quiz

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## Week20

- 6.7 Emoticons
- 6.8 Animation
- Unit6 Vocabulary & Test Review
- Unit6 Assignment: Animation
- Unit6 Test

## Week21

- 7.1 What are Functions?
- 7.2 Creating Functions
- 7.3 Parameters

## Week22

- Unit7 Quiz
- 7.4 Returning Values
- 7.5 Using Several Functions
- 7.6 Tracing Code

## Week23

- Unit7 Vocabulary & Test Review

- Unit7Assignment: Calendar
- Unit7Test

## Week24

- 8.1WhatareLists?
- 8.2DeclaringLists
- 8.3Elementvs Index
- 8.4ForLoopsandLists
- 8.5ListFunctions

## Week25

- Unit8Quiz
- 8.6ListsasParameters
- 8.7ListsandData
- 8.8SortingandSearching
- 8.9WritingaSimpleSearch

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## Week 26

- 8.10 Writing a Simple Sort
- Unit 8 Vocabulary & Test Review
- Unit 8 Assignment: Birthday Organizer
- Unit 8 Test

## Week 27

- 9.1 What is a 2D List?
- 9.2 Declaring 2D List
- 9.3 Loops with 2D Lists

## Week 28

- Unit 9 Quiz
- 9.4 Algorithms
- 9.5 Algorithms Continued

- 9.6 Tracing Code 2D

## Week 29

- Unit 9 Vocabulary & Test Review
- Unit 9 Assignment: Matrices
- Unit 9 Test

## Week 30

- 10.1 Debugging Logic
- 10.2 Evaluating Correctness
- 10.3 Console Input and Conditionals
- 10.4 Data Structures
- 10.5 Randomness

## Week 31

- Robotics

## Week ??

- 11.1 What is the Internet?
- 11.2 IP Addressing and DNS
- 11.3 Packets and Routers

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## Week ??

- 11.4 Making Web Pages – HTML Part 1
- Unit 11 Quiz
- 11.5 Making Web Pages – HTML Part 2
- 11.6 Making Web Pages – HTML Part 3
- 11.7 Cybersecurity

## Week ??

- 11.8 Net Neutrality
- Unit 11 Vocabulary & Test Review
- Unit 11 Assignment: Build Your Own Webpage
- Unit 11 Test

## **Week ?? - Careers in CS Module**

- Lesson 1: Who Uses Computer Science?
- Lesson 2: Data Scientist
- Lesson 3: Computer Science in Medicine
- Lesson 4: Game Developer
- Lesson 5: Computer Science in Entertainment
- Lesson 6: Dance and Music

## **Week ?? - Careers in CS Module**

- Lesson 7: Game Designers
- Lesson 8: Journey to Cryptography
- Lesson 9: Social Justice
- Lesson 10: Sports
- Lesson 11: Starting Your Own Business
- Lesson 12: Web Design
- Course Wrap-Up

## Assignment Groups Weight

### Assignment Groups Weight

☒ Weight final grade based on assignment groups

|                         |      |   |
|-------------------------|------|---|
| Practice Activities     | 20   | % |
| Assignments and Quizzes | 40   | % |
| Tests                   | 40   | % |
| Total                   | 100% |   |

## Fall 2024 - CUSD Cell Phone Policy

**High School:** High school students may not use cell phones, smart watches, pagers, or other mobile communication devices during instructional time. Mobile communication devices shall be turned off and kept out of sight during instructional time. *Instructional time* is defined as any scheduled class period and any other time during the school day when students are expected to be engaged in a learning activity.

During non-instructional time, high school students may use cell phones, smart watches, pagers, or other mobile communication devices on campus as long as the device is utilized in accordance with law, the district Acceptable Use Agreement, and any rules that individual school sites may impose.

### **Violation Protocol.**

**First Offense:** Student warning

**Second Offense:** Student warning, teacher contact to parent recommended, teacher/staff may take device.

**Third Offense:** Teacher/staff takes device to be returned to student at the end of class period, teachers contact parent, referral to office for documentation in student information system.

**Fourth Offense:** Device delivered by teacher/staff to office for pick up after school, contact parent, referral to office for documentation in student information system. Additional progressive discipline measures will be employed as needed.

[Cell Phone Classroom Poster – High School](#)

[District Website on Cell Phone Policy](#)